Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Expanding Flexible Use of the 3.7 to 4.2 GHz Band	)	GN Docket No. 18-122
	)	

COMMENTS OF THE CONTENT COMPANIES

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SUMMARY

CBS Corporation, Discovery, Inc., The Walt Disney Company, 21st Century Fox, Inc., Univision Communications Inc., and Viacom Inc. (collectively, the "Content Companies") rely heavily on the 3.7-4.2 GHz spectrum band ("C-band") to distribute compelling and popular sports, news, and entertainment programming to nearly 120 million American television households, representing over 300 million people. Proposals in the NPRM, however, would put that nationwide video delivery system at risk. While the Content Companies support actions that facilitate the roll-out of 5G services, opening up this spectrum to new uses need not, and should not, be a zero-sum game that comes at the expense of consumers' access to the most popular news, sports and entertainment programming.

Put simply, there is no adequate substitute to the C-band for the Nation's video delivery pipeline. Alternative spectrum bands suffer from weather-related reliability issues, and fiber is not widely available enough to replace current fixed satellite services ("FSS") usage of the C-band. And technology-based solutions such as enhanced video compression could sacrifice video quality, particularly for increasingly popular 4K and ultra-HD programming.

In the absence of adequate substitutes for C-band video delivery, the Commission should proceed with great caution before adopting any spectrum-clearing proposal in the C-band. In particular, any Commission action making C-band spectrum available for mobile use should adhere to four core principles, which should be codified in the Commission's rules and made a condition of satellite companies' and mobile providers' licenses, as applicable:

- First, any band-clearing should be limited to no more than 100 MHz of the lowest portion of the C-band (3700-3800 MHz), to ensure that sufficient spectrum remains available exclusively for video delivery. Similarly, the Commission should not adopt a mobile allocation for the portion of the C-band that remains available to video delivery.

- Second, the Commission should require specific, enforceable measures to protect video delivery in the C-band. These measures include, but are not limited to, a sufficient guard band, the installation of filters on all C-band earth stations, reimbursement of all costs incurred, and an appropriate out-of-band emissions limit to any portion of the C-band designated for mobile use.

- Third, the Commission should lift the current freeze on new registrations and licenses in the C-band, to account for the evolution of video delivery using the C-band.

- Fourth, the Commission should retain full-band, full-arc coordination in any repacked C-band—the flexibility of which remains crucial to uninterrupted video content delivery, particularly for live or unexpected events that require swift movement to other satellites and/or frequencies.

Regardless of whether the Commission moves forward with repacking the C-band to account for mobile usage, the Commission should not authorize any new fixed-to-multipoint transmissions in the portion of the C-band that remains available to video delivery. Given the extensive use of the C-band today, a repacked C-band simply could not accommodate new fixed wireless broadband uses. Point-to-multipoint transmissions necessarily emit higher-powered signals in many directions, which would severely complicate frequency coordination and increase the potential for harmful interference to reception of video downlinks. Allowing fixed wireless usage in the C-band also would make repacking the band for mobile usage far more difficult, if not impossible, and thus would require the Commission to set aside *less* C-band spectrum for mobile usage. The Commission accordingly should abandon the proposal to authorize fixed, point-to-multipoint transmissions in a repacked C-band.

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CBS Corporation, Discovery, Inc., The Walt Disney Company, 21st Century Fox, Inc., Univision Communications Inc., and Viacom Inc. (collectively, the "Content Companies") file these comments in response to the Commission's Notice of Proposed Rulemaking ("NPRM") in the above-captioned proceeding, which seeks comment on the future of the 3.7-4.2 GHz spectrum band ("C-band").[1]

Today, the C-band ensures the reliable distribution of video programming to nearly 120 million American households, representing over 300 million people. Proposals in the NPRM, however, put that nationwide video delivery system at risk. While the Content Companies support actions that facilitate the roll-out of 5G services, opening up this spectrum to new uses need not, and should not, be a zero-sum game that comes at the expense of consumers' access to the most popular news, sports and entertainment programming. After all, one of the prime motivations for consumer adoption of broadband has been consumption of highly-popular video programming, and the distribution pipeline for the majority of that programming is built on the C-band. Actions that cause that content distribution pipeline to break down would fail to serve any public policy goal.

[1] *In re Expanding Flexible Use of the 3.7 to 4.2 GHz Band et al.*, Order and Notice of Proposed Rulemaking, FCC 18-91, GN Docket No. 18-122 et al. (rel. July 13, 2018) (hereinafter "NPRM").

A threshold question for any proposal for new uses of the C-band should be: does the proposal demonstrate with sufficient clarity how it will preserve uninterrupted video delivery to the American public? None of the proposals described in the NPRM, however, has been able to answer that threshold question sufficiently. And the proposal to allow fixed wireless usage in the C-band—especially a repacked C-band—risks both substantial harm to video delivery *and* will make a successful spectrum repack virtually impossible, thereby undermining the goal of freeing up spectrum for mobile 5G services.

I. VIDEO DELIVERY TO NEARLY 120 MILLION AMERICAN HOUSEHOLDS DEPENDS ON THE C-BAND.

The Content Companies rely on fixed satellite services ("FSS") downlink transmissions in the C-band to distribute some of the nation's most popular sports, news, and entertainment programming—representing billions of dollars in value—to nearly 120 million American television households.[2] C-band spectrum forms the backbone of the infrastructure for delivering video content to consumers. It is the principal pathway for the delivery of programming to each of the thousands of head-ends of multichannel video programming distributors and each of the well over 1,000 broadcast television stations affiliated with national television networks. Some video programmers likewise use the C-band to deliver content to over-the-top video distributors. Moreover, many of the Content Companies depend upon temporary fixed links in the C-band to transport video from the field back to studios and on to viewers. Without these fixed links, the live-event audio and video essential to producing breaking news would falter.

[2] *See, e.g.*, Comments of the Content Companies, GN Docket No. 18-122 at 1-3 (filed May 31, 2018) (hereinafter "Content Companies MOBILE NOW Comments"); Comments of the Content Companies, GN Docket No. 17-183 at 1 & n.2 (filed Oct. 2, 2017) (hereinafter "Content Companies NOI Comments").

The NPRM seeks comments on whether there are "alternative technologies available that could wholly or partially replace the services provided by FSS without significant disruption to existing customers."[3] The answer is no; neither other spectrum bands nor terrestrial alternatives are adequate substitutes for the current FSS usage of the C-band, and shifting C-band video delivery to these alternatives would also present incredibly complex operational challenges. As the NPRM acknowledges, the record in this and related proceedings reflects that the Ku-band is not an acceptable substitute for C-band spectrum, as it lacks the reliability of the C-band and is susceptible to atmospheric rain fades.[4]

Nor can fiber substitute for C-band video content delivery, as the nation's fiber footprint is insufficient to cover C-band's nationwide reach. Fiber "is most prevalent in urban areas while in rural areas there are fewer FSS substitutes,"[5] meaning that the existing fiber footprint is inadequate in large swaths of the country. Even in urban areas, fiber is not a reliable alternative to uninterrupted video content delivery because it is not uniformly available throughout these areas and is prone to the risk of fiber cuts, particularly during construction projects or in the wake of severe weather events.[6] And distributing regionalized programming, including popular

[3] NPRM at ¶ 57.

[4] NPRM at ¶ 107 & n.162; *see also, e.g.*, Reply Comments of the Satellite Industry Association, GN Docket No. 17-183 at 20 (filed Nov. 15, 2017); Reply Comments of SES Americom, Inc., GN Docket No. 17-183 at 12–13 (filed Nov. 15, 2017); Reply Comments of NCTA - The Internet & Television Association, GN Docket No. 17-183 at 4 (filed Nov. 15, 2017).

[5] NPRM at ¶ 64.

[6] *See* Marguerite Reardon, *Fiber Outages Slow Cell Recovery After Hurricane Michael*, CNET.com (Oct. 16, 2018), https://www.cnet.com/news/fiber-outages-slow-cell-recovery-after-hurricane-michael/ ("When Hurricane Michael barreled into the Florida Panhandle last week, the Category 4 storm with sustained winds of 155 miles per hour not only tore down electrical wires knocking out power for hundreds of thousands residents, but it also ripped apart fiber networks necessary for delivering broadband and mobile phone service to the region."). Damage from severe weather events, including hurricanes, is not necessarily limited to a single market. In 2016, for instance, Hurricane Matthew caused fiber cuts in Florida and South Carolina, which in turn caused total fiber connectivity losses on certain paths along the east coast. Had this sort of event occurred in a terrestrial distribution model—without being

sports programming, is particularly infeasible via fiber because of the need to switch feeds quickly, including from locations that are not served or are underserved by fiber. The suggestion that incumbent C-band uses could be adequately protected by "extending fiber" therefore is neither reasonably feasible nor cost effective.[7]

The NPRM also asks whether "using greater compression to reduce the capacity required to carry a given amount of programming or data" would facilitate band-clearing.[8] This is not a workable solution, as it risks undermining the quality of video content and inhibiting the ongoing rollout of 4K and ultra-HD video to consumers.

Given the critical importance of the C-band to video content delivery and the lack of suitable alternatives, the Commission should abandon the false premise that existing FSS usage in the C-band could be shifted to alternative spectrum bands or terrestrial alternatives, or could operate under new video compression mandates. Instead, the focus should be on preventing harmful interference to FSS usage *within the C-band*.

II. PARTIES PROPOSING NEW USES OF THE C-BAND HAVE NOT BORNE THEIR BURDEN OF DEMONSTRATING THAT THEY WILL PROTECT VIDEO DELIVERY SERVICES.

While the NPRM appropriately articulates an intention to "protect incumbent earth stations from harmful interference," none of the proposals described in the NPRM sufficiently describe *how* earth stations—and the critical video delivery services they enable—will be protected.[9] The NPRM includes many definitive statements of the Commission's intent to make

able to rely on the C-band—it could have caused the loss of a network's ability to distribute to as many as eight television markets (including two of the top twenty markets) for several days.

[7] *See* NPRM at ¶ 88; *see also, e.g.*, Content Companies Mobile Now Comments at 3–4.

[8] NPRM at ¶ 106.

[9] NPRM at ¶ 27.

the C-band available to new uses, but it provides few details on how to protect incumbent earth stations. Likewise, the NPRM devotes much greater attention to the relative merits of different mechanisms for reallocating C-band spectrum (i.e., auctions, market-based band clearing) than it does to protecting the services displaced by that reallocation. The satellite companies now operating as the "C-Band Alliance" or "CBA" commendably have made some significant commitments intended to provide protection for FSS users, including the Content Companies. But neither the NPRM nor the CBA's commitments go far enough to ensure that video delivery and the critical role FSS spectrum plays in the video marketplace will remain fully protected.[10]

An exquisitely designed auction or market-based clearing system will be for naught if, at the end of the day, the spectrum it purports to "free up" is subject to years of relocation disputes, interference complaints, and disruption to the viewing public. Thus, before deciding upon one spectrum-clearing mechanism over another, the Commission should articulate the core protections that any such mechanism must provide to video delivery in the C-band. These protections, in turn, should be codified in the Commission's rules and made a condition of the license of any entity that benefits from the clearing of spectrum in the C-band (e.g., new mobile licensees, space station licensees that profit from band clearing in an auction or market-based clearing model). In particular, the Commission should adopt rules and license conditions reflecting the following principles:

First, no more than 100 MHz of the lowest portion of the C-band should be cleared, so that sufficient spectrum remains available exclusively for video delivery. Clearing 100 MHz of C-band spectrum for mobile use while sufficiently protecting FSS usage from harmful

[10] *See* Letter from Jennifer D. Hindin to Marlene H. Dortch, Federal Communications Commission, Office of the Secretary, GN Docket Nos. 17-183, 18-122 (Oct. 17, 2018) (hereinafter "CBA Oct. 17 Letter").

interference would be an incredibly complex and challenging task requiring all stakeholders to make difficult sacrifices.[11] Band clearing *beyond* the lowest 100 MHz portion of the C-band, however, could leave insufficient spectrum available for video delivery, with users crowded into a band too small to accommodate the significant, ongoing demand for video delivery. The result would be to threaten the near-perfect video content delivery via the C-band that Americans have come to rely on. A mobile allocation thus should be limited to the 3700-3800 MHz spectrum.

Similarly, the Commission should reject the NPRM's proposal to add a mobile allocation for the entirety of the C-band, including the portion that remains devoted to video delivery.[12] Amending the Table of Frequency Allocations with a mobile allocation for the entire C-band would place a permanent cloud over the video delivery portion of the band and deprive the Content Companies and other FSS users of the confidence and certainty needed to invest in video delivery services via the C-band going forward. The ever-present risk of a further reduction in spectrum available for FSS would shroud the band in uncertainty and serve as an overhang that threatens to undermine the video distribution marketplace for years to come. There is no reason for the FCC to take such a risky approach today, especially before it knows how much demand will exist for the initially reallocated spectrum. At a minimum, adoption of a mobile allocation beyond the initially allocated 3700-3800 MHz spectrum should occur only after a further period of notice and comment through which all stakeholders may be heard.

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[11] *See* Letter from Jennifer D. Hindin to Marlene H. Dortch, Federal Communications Commission, Office of the Secretary, GN Docket Nos. 17-183, 18-122 (Oct. 9, 2018); *see also* NPRM at ¶¶ 172–74 (asking a series of questions about the Intelsat/SES proposal, including about the width of the guard band that would be necessary, details about filter performance, and a series of additional technical challenges that would arise if a portion of the C-band were cleared for mobile use).

[12] NPRM at ¶ 1.

To be clear, a reallocation of 100 MHz of spectrum for mobile use would be a major step forward in facilitating the rollout of 5G services. A reallocation of 100 MHz would exceed the amount of spectrum that the Commission has recently reallocated for mobile usage in many other bands.[13] And new licensees would be able to maximize use of this spectrum resource through deployment of efficient small cells.[14] It is no wonder, therefore, that AT&T recently told the Commission in the 2.5 GHz proceeding that an "offer of 50-100 MHz of mid-band spectrum nationwide" would be a "huge boon to the Nation's 5G ambitions" and "would give multiple buyers an incentive to participate" in an auction.[15]

Second, the Commission should require specific measures to protect existing C-band operation as part of its rules and an enforceable condition to satellite companies' and mobile providers' licenses. C-band earth stations must receive a low-power signal from a satellite transmitter orbiting the Earth some 22,236 miles above the surface of the equator to operate, making them especially vulnerable to terrestrial emissions at levels contemplated for 5G mobile broadband services.[16] The Commission accordingly should adopt measures that include, at a minimum, a sufficient guard band, the installation of filters on all C-band earth stations to prevent saturation of the Low Noise Block converters in those earth stations, and an appropriate out-of-band emissions ("OOBE") limit applicable to any portion of the C-band designated for

[13] For instance, the broadcast incentive auction—a major undertaking requiring years of planning that is still underway—cleared 70 MHz for mobile usage (and 14 MHz for unlicensed usage) in the 600 MHz band. *See* NPRM at ¶ 4. And the 2014 AWS-3 auction auctioned 65 MHz of mid-band spectrum, which attracted significant interest from wireless carriers. *See* NPRM at ¶ 134 n.231.

[14] *See* NPRM at ¶ 5 ("[M]id-band spectrum presents wireless providers with the opportunity to deploy base stations using smaller cells to achieve higher spectrum reuse than the lower frequency bands while still providing indoor coverage.").

[15] Reply Comments of AT&T, WT Docket No. 18-120 at 10 (filed Sept. 7, 2018).

[16] *See* Content Companies NOI Comments at 6.

mobile usage—at least as protective as the OOBE limit adopted in the 3.5 GHz proceeding.[17] But even these measures will, at times, fail to prevent harmful interference. The Commission accordingly should adopt a detailed and rigorous remediation process for whenever reception of C-band downlinks experiences harmful interference.

Of course, these measures that would be necessary if the Commission upends the current band plan and repacks C-band uses into a band that is smaller by as much as 20 percent would impose substantial costs on satellite providers, their customers, and earth station operators, including the Content Companies. And creators of video programming could incur even more substantial costs due to the increased cost of satellite capacity in the wake of a repacked C-band with less spectrum available for FSS usage. Thus, any proposal to clear C-band spectrum for mobile use should include enforceable commitments to reimburse existing users—both earth station operators and customers—for these substantial costs.[18]

Third, the Commission should lift the "freeze" on new registrations and licenses to account for the evolution of video delivery systems using the C-band. By proposing to allow *no* new registrations or licenses (only modifications at *existing* locations), the NPRM mistakenly assumes that the video distribution pipeline can function well in perpetuity under the same parameters that were in place on April 19, 2018.[19] This is a fallacy. Just as mobile providers could not maintain functioning networks if forbidden to deploy new small and macro cells, the

[17] *See* NPRM at ¶ 172; *see also In re Promoting Investment in the 3550-3700 MHz Band*, Report and Order, FCC 18-149, ¶¶ 133–135 (rel. Oct. 24, 2018).

[18] *See* NPRM at ¶¶ 29, 76; *see also* CBA Oct. 17 Letter.

[19] *See* NPRM at ¶ 30; *see also Temporary Freeze on Applications for New or Modified Fixed Satellite Service Earth Stations and Fixed Microwave Stations in the 3.7-4.2 GHz Band; 90-Day Window to File Applications for Earth Stations Currently Operating in 3.7-4.2 GHz Band*, GN Docket Nos. 17-183, 18-122, Public Notice, DA 18-398, 2 (IB/PSHSB/WTB April 19, 2018) ("For purposes of this Notice, existing earth stations are those that have been constructed and are operational as of April 19, 2018.").

Content Companies and other earth station operators require flexibility to obtain new licenses and registrations as needs evolve. The Content Companies and other earth station operators thus should be able to make use of additional C-band capacity and register or license additional earth station locations as their operations change and expand over time. If the freeze on new earth station registration is made permanent, as proposed by the NPRM, with each year it will become more challenging for video programmers to make video programming reliably available to the public.

Fourth, the Commission should retain full-band, full-arc coordination in the repacked C-band. None of the proposals to date have offered suitable alternatives to the flexibility that full-band, full-arc protection allows. That flexibility remains essential to nationwide video content delivery when, for instance, satellite failures, emergency conditions on the ground, or unexpected interference necessitates prompt movement to another satellite and/or frequency.[20] The Content Companies accordingly welcome the CBA's statement that full-band, full-arc coordination is necessary to "maintain" existing levels of reliability as well as the "vibrant news and sports-gathering capability" which the viewing public has come to expect.[21]

The Content Companies rely on full-band, full-arc coordination to quickly transition to alternative satellites or frequencies for both planned and unplanned events. These events frequently require temporary fixed uplinks to facilitate breaking news, weather, and other emergent circumstances, which by definition require the use of satellite uplinks with little to no

[20] *See* Content Companies NOI Comments at 3–4.

[21] CBA Oct. 17 Letter. *See* also Letter from Michelle C. Farquhar, Counsel to SES, to Marlene H. Dortch, Secretary, Federal Communications Commission, GN Docket Nos. 17-183, 18-122 (July 5, 2018) ("The Parties also noted that the draft NPRM's proposal to do away with full-band, full-arc ('FBFA') coordination fails to recognize that FBFA flexibility for earth stations will be essential in order to facilitate any rebanding to make spectrum available for terrestrial mobile operations.").

advance notice or opportunity for coordination with other services. Indeed, full-band, full-arc coordination is likely to become *more* important in a crowded, repacked C-band. In this more difficult spectral environment, the Content Companies and other programmers will find it necessary to change satellites and/or frequencies more often in an attempt to mitigate interference to downlinks.

Full-band, full-arc coordination also enables video programmers to reliably produce live events in locations where fiber alternatives are either unavailable or subject to network outages. These events regularly utilize more than a dozen satellites across the arc at various frequencies, and the loss of full-band, full-arc coordination could lead to insufficient capacity and diminished reliability of these live transmissions.

III. ALLOWING FIXED WIRELESS USE IN A SUBSTANTIALLY SMALLER C-BAND WOULD FURTHER HARM VIDEO DELIVERY AND MAKE A SUCCESSFUL REPACKING SCHEME VIRTUALLY IMPOSSIBLE.

Repacking video delivery into a smaller C-band presents many challenges, as described above. Those challenges would become insurmountable, however, if the Commission were to authorize new fixed-to-multipoint transmissions (i.e., fixed wireless broadband) in the portion of the C-band that remains available to FSS.[22]

The C-band is already quite crowded: the IBFS database reflects that more than 16,000 fixed earth stations were registered in the C-band between April 1 and October 25, 2018, with nearly 40 percent of those registered just since October 1, and some estimates suggest that as many as 30,000 C-band earth stations operate in the United States.[23] Given the extensive usage

[22] *See* NPRM at ¶¶ 116–19.

[23] *See* FCC Advanced IBFS Search; *see also* Karen Johnson, *C-band Takes Another Hit*, Linkupcommunications.com (May 31, 2018), https://www.linkupcommunications.com/c-band-takes-another-hit/ ("Industry experts believe there are anywhere from 25 to 30,000 C-band earth stations in the US . . . .").

of the C-band today, a repacked C-band simply could not accommodate new fixed wireless broadband uses, even if these fixed wireless services operated on a secondary basis to FSS. Point-to-multipoint transmissions necessarily emit high-powered signals in many directions, which greatly increases the difficulty of frequency coordination and the potential for harmful interference to existing C-band usage.[24] And neither the NPRM nor the Broadband Access Coalition ("BAC") petition upon which the NPRM proposal was based includes any concrete explanation as to how the existing C-band usage by the Content Companies and others would be adequately protected.[25] For instance, while the NPRM suggests that fixed wireless broadband services would operate "on a frequency-coordinated basis to protect actual FSS operations," neither the BAC petition nor the NPRM provides any explanation as to how this coordination could be accomplished, particularly on extremely short notice.

Allowing fixed wireless usage in the C-band also would make repacking the band for mobile usage far more difficult, if not impossible, and it thus would require the Commission to set aside *less* C-band spectrum for mobile usage.[26] Particularly in a re-packed C-band, there is no feasible way to permit fixed wireless usage while "protect[ing] incumbent FSS earth stations from harmful interference and avoid[ing] disruption to existing operations in the band."[27] Thus, in response to the NPRM's request for comment as to "how permitting fixed wireless would affect the possible future clearing of the band for flexible use," the Content Companies submit that in this case the Commission must choose between fixed wireless and mobile uses. Any

[24] *See* Content Companies NOI Comments at 7.

[25] *See* NPRM at ¶¶ 116–19; *see also* Content Companies NOI Comments at 7–8.

[26] NPRM at ¶ 117.

[27] NPRM at ¶ 116.

attempt to accommodate both goals would cause substantial harm to FSS usage of the C-band and endanger the reliability of video content delivery across the country.

CONCLUSION

The C-band serves as the backbone for distributing video programming to nearly 120 million American households. To preserve the public's access to news, sports, and entertainment programming, the Content Companies urge the Commission to consider only those reallocation proposals that provide baseline, enforceable protections to the Nation's video delivery pipeline. None of the proposals described in the NPRM, however, sufficiently explains if or how they would provide such protections to earth station operators and the viewing public. Moreover, the Commission should abandon altogether the proposal to introduce new fixed, point-to-multipoint transmissions into a smaller, repacked C-band. Introducing new fixed transmissions will only complicate and undermine efforts towards a successful repacking.

Respectfully submitted,

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